Nos. 16-1543, 16-1545

United States Court of Appeals
FOR THE FEDERAL CIRCUIT

GOOGLE INC.,

Appellant,

v.

INTELLECTUAL VENTURES II LLC,

Cross-Appellant.

APPEAL FROM THE U.S. PATENT AND TRADEMARK OFFICE
PATENT TRIAL AND APPEAL BOARD
INTER PARTES REVIEW NO. IPR2014-00787

PRINCIPAL BRIEF OF CROSS-APPELLANT / PATENT OWNER INTELLECTUAL VENTURES II LLC

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AUGUST 17, 2016

CERTIFICATE OF INTEREST

Counsel for Cross-Appellant Intellectual Ventures II LLC certifies the following:

1. The full name of every party represented by me is:

   Intellectual Ventures II LLC.

2. The name of the real party-in-interest represented by me is:

   Intellectual Ventures II LLC.

3. All parent corporations and any publicly held companies that own more than 10 percent or more of the stock of the party represented by me are:

   None.

4. The name of all law firms and the partners or associates that appeared for the party in the lower tribunal or are expected to appear for the party in this court and who are not listed on the docket for the current case: Knobbe, Martens, Olson & Bear, LLP: Vladislav Z. Teplitskiy.

KNOBBE, MARTENS, OLSON & BEAR, LLP

Date: August 17, 2016 By: */s/ Brenton R. Babcock*
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OTHER AUTHORITIES

STATEMENT OF RELATED CASES

Appeal Nos. 16-1543 and 16-1545 are the only appeals from the present action.

Patent Owner Intellectual Ventures II LLC ("IV") has asserted United States Patent No. 6,121,960 ("the '960 Patent") in the following cases filed in the United States District Court for the District of Delaware: *Intellectual Ventures I LLC et al. v. Nikon Corporation et al.*, Case No. 1:11-cv-01025-SLR and *Intellectual Ventures I LLC et al. v. Canon Inc. et al.*, Case No. 1:11-cv-00792-SLR. IV has also asserted the '960 Patent in *Intellectual Ventures I LLC et al. v. Motorola Mobility LLC*, Case No. 0:13-cv-61358-DMM, in the United States District Court for the Southern District of Florida.

I. JURISDICTIONAL STATEMENT

IV agrees with Google's jurisdictional statement. In addition, IV notes that it timely filed its Notice of Cross-Appeal on January 4, 2016.

— RESPONSE TO GOOGLE'S APPEAL —

II. STATEMENT OF THE ISSUES

1. Where none of the prior art discloses the use of "logical operators," is there substantial evidence to support the Board's factual finding that none of the prior art of record discloses the claim limitation requiring the use of "logical operators" to blend pixels to create a composite image?

2. Given the Board's underlying factual finding that none of the prior art references relied on by Google discloses the "logical operators" for blending limitation, did the Board correctly conclude that Google failed to prove that claims 1-3, 5, 7-10, and 12-14 are unpatentable?

III. STATEMENT OF THE CASE AND FACTS

A. The '960 Patent

The '960 Patent relates to touch-screen devices, such as smartphones. Appx104, Abstract. The display screens of touch-screen devices serve two functions: (1) they display data and graphical

information, and (2) they serve as a user-input device by superimposing user-input controls—such as keyboards—over the main image displayed on the device.

The prior art includes multiple disadvantageous methods of superimposing an image of a keyboard over a main image on a touch-screen display. The claimed improvement of the ’960 Patent relevant to Google’s appeal is the use of ***logical operators*** to ***blend*** (a) pixels from a main image with (b) pixels from a representation of a key (of a keyboard), to form (c) a blended, composite image. The “logical operators” limitation recites:

> wherein the variable-pixel control includes ***logical operators*** to provide different ***blending***/merging effects such that ***individual pixels*** of the touch-activated input device can be ***dedicated simultaneously to both the main image and the*** representation of at least one ***key***.

Claim 1, Appx119 at 12:25-29 (emphases added). The “dedicated simultaneously” language requires that each individual pixel of the blended, composite image has a contribution from both (a) the main image and (b) the representation of a key. Appx1106-1107 ¶ 56; Appx1117 ¶ 74. In other words, each individual pixel is not simply selected from either the main image or the representation of the key,

but instead is a blended combination of a pixel from the main image with a pixel from the representation of the key. *Id.*

Importantly, claim 1 explicitly requires that "logical operators" provide the blending, so this limitation cannot be satisfied by ***any*** blending operation. Nor is it satisfied by the mere use of logical operators for ***any*** purpose. Rather, the limitation requires the use of logical operators for the specific purpose of blending pixels from the main image with pixels from the representation of the key to create a blended, composite image.

B. Google's Arguments and Evidence Below

Below, Google argued that Gough anticipates the claims and that the combination of Buxton, Bier, and Harrison renders the claims obvious. Google asserted that Gough and Buxton each disclose the "logical operators" limitation. Google cited virtually no evidence in support of these conclusory assertions.

With respect to Gough, Google referenced just two portions of Gough that disclose blending at a very high level of generality, neither of which includes any details of ***how*** the blending is performed. Appx55, Appx58-59. Google first relied on Figures 10 and 10A-10F of Gough. *Id.*

Google next relied on Figures 18 and 19 of Gough. Appx55. However, as explained below, the Board found that neither those figures nor the related text disclose the use of logical operators for blending. At most, Gough generically discloses that data "is blended" but does not disclose ***any*** details of how the blending is accomplished.

With respect to Buxton, Google relied on Buxton's disclosure of "continuous algorithms" using the following mathematical "alpha-blending" equation:

$$I = aI_1 + (1\text{-}a)I_2$$

Appx440 at 17:17-28; Appx1133 ¶ 105. It is undisputed that the disclosed equation uses three ***arithmetic operators***—namely, addition, subtraction, and multiplication. Google argues that arithmetic operators should be considered as disclosing the claim, even though the claim, by contrast, requires the use of ***logical operators*** for blending. In its Reply to the Board, Google tried to reconcile the distinction between Buxton's arithmetic operators and the claimed logical operators by asserting (incorrectly) that arithmetic operators are identical to logical operators.

Google also relied on Buxton's disclosure of "discrete algorithms" that create a mask for selecting pixels. But, as explained below, Buxton expressly discloses that the mask only ***selects*** each pixel from two options—the foreground image and the background image—it does not perform the ***blending*** process required by the claims. Appx439 at 16:20-23.

C. IV's Arguments and Evidence Below

1. Gough does not disclose the "logical operators" limitation.

The Board correctly found, based on IV's ample evidence, that Google failed to meet its burden to prove that Gough discloses the "logical operators" limitation. The simple fact is that the references do not show the use of logical operators for blending, and Google could never overcome the inherent deficiencies of these references through attorney argument or its expert's conclusions. On the other hand, IV's expert, Dr. Craig Rosenberg, fully analyzed Gough and explained that Gough does not disclose the use of logical operators for blending. Dr. Rosenberg testified that, while Figure 10 of Gough discloses the general concept of blending, it "does not explain how the blending process is performed." Appx1124 ¶ 88. He further testified that Figure 10 "does

not describe using logical operators or Boolean logic." Appx1124-1125 ¶ 89.

Dr. Rosenberg also testified that the color look-up table of Figures 18 and 19 of Gough does not disclose the use of logical operators. *Id*. He explained that while the look-up table can "quickly determine the blended value for the pixel," it "does not describe using logical operators or Boolean logic." *Id*. He further explained that there are various ways to blend images together, not all of which will use logical operators. *Id*. Dr. Rosenberg's opinions are well supported not only by Gough's itself, but also by the cross-examination testimony of Google's own expert, Mr. Ward.

2. **<u>Buxton does not disclose the "logical operators" limitation.</u>**

IV also introduced ample evidence that Buxton does not disclose the "logical operators" limitation.

a. **<u>Buxton's alpha-blending equation</u>**

With respect to Buxton's arithmetic alpha-blending equation, Dr. Rosenberg's testimony and documentary evidence established that a skilled artisan ***within the computer field*** would distinguish arithmetic operators from logical operators. Dr. Rosenberg explained

that Buxton's "equation describes operations that are solely arithmetic rather than logical." Appx1133 ¶ 106. Dr. Rosenberg further explained that "Buxton does not describe or suggest that alpha blending uses logical operators." *Id.* Dr. Rosenberg's opinions are supported by his extensive experience and knowledge, as well as an authoritative IEEE dictionary. *Id.* The dictionary defines "logical operation" as "any nonarithmetic computer operation" and defines "logic operation" as "[a]ny nonarithmetical operation." Appx1079-1080.

Again, Google's own expert explained that logical operators and arithmetic operators are different. Mr. Ward testified that computers common in the early 1980s had separate categories for arithmetic and logical instructions. Appx1949-1951 at 116:10-118:14. Mr. Ward admitted that MIPS, a typical instruction set in the 1980s, had separate arithmetic and logical instructions. The following chart from an influential textbook confirms this fact:

MIPS assembly language

Category	Instruction	Example	Meaning	Comments
Arithmetic	add	add $s1,$s2,$s3	$s1 = $s2 + $s3	Three operands; overflow detected
	subtract	sub $s1,$s2,$s3	$s1 = $s2 – $s3	Three operands; overflow detected
	add immediate	addi $s1,$s2,100	$s1 = $s2 + 100	+ constant; overflow detected
	add unsigned	addu $s1,$s2,$s3	$s1 = $s2 + $s3	Three operands; overflow undetected
	subtract unsigned	subu $s1,$s2,$s3	$s1 = $s2 – $s3	Three operands; overflow undetected
	add immediate unsigned	addiu $s1,$s2,100	$s1 = $s2 + 100	+ constant; overflow undetected
	move from coprocessor register	mfc0 $s1,$epc	$s1 = $epc	Used to copy Exception PC plus other special registers
	multiply	mult $s2,$s3	Hi, Lo = $s2 × $s3	64-bit signed product in Hi, Lo
	multiply unsigned	multu $s2,$s3	Hi, Lo = $s2 × $s3	64-bit unsigned product in Hi, Lo
	divide	div $s2,$s3	Lo = $s2 / $s3, Hi = $s2 mod $s3	Lo = quotient, Hi = remainder
	divide unsigned	divu $s2,$s3	Lo = $s2 / $s3, Hi = $s2 mod $s3	Unsigned quotient and remainder
	move from Hi	mfhi $s1	$s1 = Hi	Used to get copy of Hi
	move from Lo	mflo $s1	$s1 = Lo	Used to get copy of Lo
Logical	and	and $s1,$s2,$s3	$s1 = $s2 & $s3	Three reg. operands; logical AND
	or	or $s1,$s2,$s3	$s1 = $s2 | $s3	Three reg. operands; logical OR
	and immediate	andi $s1,$s2,100	$s1 = $s2 & 100	Logical AND reg, constant
	or immediate	ori $s1,$s2,100	$s1 = $s2 | 100	Logical OR reg, constant
	shift left logical	sll $s1,$s2,10	$s1 = $s2 << 10	Shift left by constant
	shift right logical	srl $s1,$s2,10	$s1 = $s2 >> 10	Shift right by constant

Appx1823; Appx2307 (highlighting added).

Thus, both documentary evidence and expert testimony show that arithmetic and logical operators are different.

b. <u>Buxton's discrete algorithms</u>

Buxton expressly discloses that the mask created by Buxton's discrete algorithms only ***selects*** each pixel from two options—the foreground image and the background image:

> Mask bits which are "on" select an associated pixel from a foreground image; mask bits which are "off" select an associated background image pixel. Accordingly, masks always work using a binary decision criteria.

Appx439 at 16:20-23. Thus, Buxton's discrete algorithms do not use logical operators for ***blending*** pixels from the main image with pixels from the representation of the key. Dr. Rosenberg's testimony confirms that Buxton's discrete algorithms do not allow individual pixels to be dedicated simultaneously to both the main image and the representation of a key. Appx1134-1135 ¶¶ 107-109.

D. The Board's Final Written Decision

The Board weighed the evidence and found that the prior art does not disclose the "logical operators" limitation. Accordingly, the Board concluded that Google did not meet its burden to prove that claims 1-3, 5, 7-10, and 12-14 are unpatentable.

1. Gough

The Board considered all the evidence Google presented. Specifically, the Board considered the figures and related text of Figures 10, 10A-10F, and 18-19. Appx11-14 (discussion of Figures 10 and 10A-10F); 15 (discussion of color look-up table of Figures 18-19). However, after weighing the evidence, the Board found that Gough does not disclose the use of logical operators for blending.

The Board gave two independent reasons for its finding. First, Google failed to make a *prima facie* case of anticipation in the Petition. Appx15 ("Petitioner does not explain adequately where the detailed analysis set forth in the Reply is made in the Petition."). Second, in the alternative, the Board considered Google's reply arguments and did "not find the arguments persuasive." *Id.* Accordingly, the Board found that Gough does not disclose the "logical operators" limitation and, thus, that Google failed to meet its burden to prove unpatentability. Appx16.

2. <u>Buxton</u>

The Board expressly addressed and rejected Google's argument that Buxton's alpha-blending equation meets the "logical operators" limitation. Appx23-25. The Board squarely addressed Google's primary argument on appeal—namely, that "any equation involving multiplication, addition, or subtraction (as well as division) are logical operations, in a computer." Appx24. "After considering all evidence and arguments," the Board agreed with IV that Buxton does not disclose the "logical operators" limitation. *Id.* The Board specifically found that Google had not established "that Buxton's alpha blending equation uses operators that manipulate binary values at the bit level, consistent with

[the Board's] construction of 'logical operators.'" *Id*. Moreover, the Board unequivocally found that the "alpha blending equation unquestionably involves arithmetic operations, which we find differ from logical operations." *Id*.

While the Board's opinion did not expressly discuss Google's reply argument about Buxton's discrete algorithms, the Board's judgment that Google did not prove the claims unpatentable necessarily rests on a finding that Buxton's discrete algorithms do not use logical operators ***for blending***. This finding should stand for at least two reasons. First, Google's Petition did not even argue that Buxton's discrete algorithms perform blending; thus it was waived, and it was improperly considered (though properly rejected). Second, Buxton expressly discloses that it is the ***continuous algorithms*** (like alpha blending)—***not*** the discrete algorithms—that perform blending. In fact, Buxton expressly discloses that the discrete algorithms create a mask for ***selecting*** pixels from ***either*** the background image ***or*** the foreground image, but they do not ***blend*** pixels from ***both*** these images.

IV. SUMMARY OF THE ARGUMENT

Google's appeal relies on the assertion that the Board made erroneous factual findings that Gough and Buxton do not disclose the use of logical operators for blending pixels from a main image with pixels from a representation of a key. This is a straightforward substantial evidence case in which the Board's factual findings are entitled to deference. Google also relies on a new obviousness theory that it would have been obvious to modify Buxton to use logical operators. But Google waived this argument because Google did not raise it below.

Here, the Board's factual findings that Gough and Buxton do not disclose logical operators for blending are supported by substantial evidence. Thus, those factual findings should be affirmed.

Google argued below that Gough anticipates the claims of the '960 Patent. Gough is an extremely weak anticipation reference because it includes only a threadbare disclosure of the general concept of blending. It omits any details about how the blending is performed. Google tried to fill in the gaps of Gough's entirely deficient disclosure by submitting a conclusory expert opinion that Gough's vague statements, such as

"data . . . is blended," and high-level figures depicting the general concept of blending, disclose the particular implementation of blending—*i.e.*, the use of logical operators—claimed. But Google's conclusory expert opinions were not supported by the disclosure of Gough or by any other evidence. Indeed, both the disclosure of Gough and the testimony of ***both*** parties' experts showed that Gough does not disclose the use of logical operators for blending to one of skill in the art. Accordingly, the Board's finding that "Petitioner's arguments [at best] suggest how Gough *could* be envisioned as using logical operators, but do not explain adequately where or how Gough expressly discloses using logical operators to carry out the blending process," is supported by substantial evidence. Appx16. The Board's factual findings, and its resulting judgment that Gough does not anticipate the "logical operators" claims, should be affirmed.

Google also argued below that the claims would have been obvious in view of Buxton, Bier, and Harrison. Within this combination, Google relied solely on Buxton as allegedly disclosing the "logical operators" limitation. In its Petition, Google argued that Buxton's arithmetic-based alpha-blending equation uses logical operators for blending. But expert

testimony and documentary evidence squarely contradicts Google's assertion that ***arithmetic*** operators like addition, subtraction, and multiplication are ***logical*** operators. Therefore, the Board's finding that Buxton's arithmetic operators are not logical operators is supported by substantial evidence.

The evidence also squarely undermines Google's alternative argument, articulated for the first time in its Reply, that Buxton's "discrete algorithms"—which define a "mask" for selecting a pixel from either a background image or a foreground image—performs the blending operation required by the "logical operators" limitation. The "logical operators" limitation requires creating composite pixels by ***blending*** pixels from a main image with pixels from a representation of a key. This limitation is not met by merely ***selecting*** a pixel from either a background image or a foreground image, as disclosed by Buxton's discrete algorithms. Accordingly, substantial evidence supports the Board's finding that Buxton does not disclose the "logical operators" limitation.

Acknowledging that it cannot win a substantial evidence review of the Board's factual findings, Google relies—for the first time on

appeal—on a new obviousness theory that it would have been obvious to modify Buxton to use logical operators for blending in place of the disclosed arithmetic alpha-blending equation. Google waived this argument because Google never raised it below. Indeed, Google's entire petition was premised on there being ***no*** difference between Buxton's arithmetic operators and the claimed logical operators.

Moreover, even if Google's new arguments were not waived, Google did not submit evidence of the underlying facts—including any reason to modify Buxton, expectation of success, or the alleged obviousness of the differences between Buxton and the claims—that would have been necessary to support a finding of obviousness. Like its arguments concerning Gough, Google's positions on Buxton are completely conclusory. Google should not be allowed to rewrite the references or the evidence on appeal. Google even takes the extraordinary step of admonishing the Board for its apparent failure to conduct an obviousness analysis that Google never properly raised. Google apparently hopes that this Court will venture beyond its appellate role to make findings of fact unsupported by the evidence of record based on new positions advanced for the first time on appeal.

This Court should decline to do so, and should affirm the Board's judgment that Google failed to prove claims 1-3, 5, 7-10, and 12-14 unpatentable.

V. ARGUMENT

A. Standard of Review

Anticipation is a question of fact reviewed for substantial evidence. *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1341 (Fed. Cir. 2016). Obviousness "is a question of law that is reviewed de novo, based on underlying findings of fact reviewed for substantial evidence." *Redline Detection, LLC v. Star Envirotech, Inc.*, 811 F.3d 435, 449 (Fed. Cir. 2015).

"Substantial evidence is more than a mere scintilla. It means such relevant evidence as a reasonable mind might accept as adequate to support a conclusion." *Blue Calypso,* 815 F.3d at 1337. "[W]here two different, inconsistent conclusions may reasonably be drawn from the evidence in record, an agency's decision to favor one conclusion over the other is the epitome of a decision that must be sustained upon review for substantial evidence." *In re Mouttet*, 686 F.3d 1322, 1331 (Fed. Cir. 2012).

B. Substantial evidence supports the Board's finding that Gough does not disclose "logical operators to provide different blending/merging effects."

The Board found that Google failed to establish Gough's anticipation of the challenged claims.Appx15-16. This finding was supported by substantial evidence, including the Gough patent itself and the testimony of IV's expert, Dr. Rosenberg. Appx14-15 (citing Appx1124-1125 ¶¶ 88-89). Moreover, Google presented virtually no evidence regarding the critical "logical operators" claim limitation. Google's petition for *inter partes* review ("Petition") failed to make a *prima facie* showing of anticipation because it did not (and could not) establish that Gough uses logical operators for blending. *Id.* at 16 ("Petitioner does not describe sufficiently how Gough expressly discloses using logical operators to accomplish the blending process.").

1. Google's Petition did not make a *prima facie* showing of anticipation because it did not establish that Gough expressly or inherently discloses the use of logical operators for blending.

As the petitioner, Google bore the burden of proving any proposition of unpatentability by a preponderance of the evidence, and that burden never shifted to the patentee. *In re Magnum Oil Tools Int'l, Ltd.*, No. 2015-1300, 2016 WL 3974202, at *6 (Fed. Cir. July 25, 2016).

This burden required Google, at a minimum, to make a *prima facie* showing of unpatentability. In its Petition, Google argued that Gough ***anticipates*** claims 1-3, 5, 7-10, and 12-14. To meet Google's burden to prove anticipation, the Petition needed to show that Gough expressly or inherently discloses ***every*** claim limitation.

Google chose to rely on wholly conclusory evidence in support of its anticipation argument. Indeed, the Petition referenced just two portions of Gough that disclose blending at a very high level of generality, neither of which includes any implementation details of ***how*** the blending is performed. Appx55, Appx58-59. Because Gough omits any implementation details, a skilled artisan could speculate, but could not conclude based on Gough's actual disclosure, how Gough performs blending. Appx1011, Appx1113-1115 ¶¶ 69-70.

Importantly, Gough does not expressly or inherently disclose the use of logical operators to perform blending. Appx1020-1022. There are multiple ways to perform blending that do ***not*** use logical operators. Appx1022. For example, as explained below, Buxton performs blending using ***arithmetic*** operators rather than logical operators. Appx1032, Appx1133 ¶ 106. Gough does not expressly disclose or necessarily imply

that it uses logical operators—rather than arithmetic operators or some other method—to perform blending. Appx1022. Therefore, the Board correctly found that Google failed to prove that Gough anticipates claims 1-3, 5, 7-10, and 12-14.

a. <u>Figures 10 and 10A-10F do not disclose logical operators.</u>

Google's Petition relied on Figures 10 and 10A-10F of Gough as allegedly disclosing the use of logical operators for blending. Appx55, Appx58-59. The Petition cited the following description of Figure 10:

> FIG. 10 illustrates the process 114 of FIG. 7 in greater detail. The 'Blending Engine' process 114 begins at 152 and, in a step 154, the shield rectangle is divided into individually blended units. For example, these blendable units can be anywhere in the range of 1 to 32 pixels, where a pixel is the smallest display unit possible on screen 40. Next, in a step 156, the RAM screen buffer data within the shield rectangle is retrieved for one blendable unit. In a step 158, the RAM overlay image buffer from within the shield rectangle has been retrieved for the one blendable unit. The data retrieved from steps 156 and 158 ***is blended to form blended data*** in the step 160.

Appx59 (citing Appx375 at 9:66-10:9) (emphasis added). This general disclosure that the "data . . . is blended to form blended data"—which discloses no detail about how the data is blended—does not expressly or inherently disclose that the data is blended ***using logical operators***.

Appx1021-1022; Appx1124-1125 ¶ 89.It simply states a truism that data that is blended will form blended data. Moreover, Figure 10 itself does not teach or even suggest that the data is blended using logical operators:

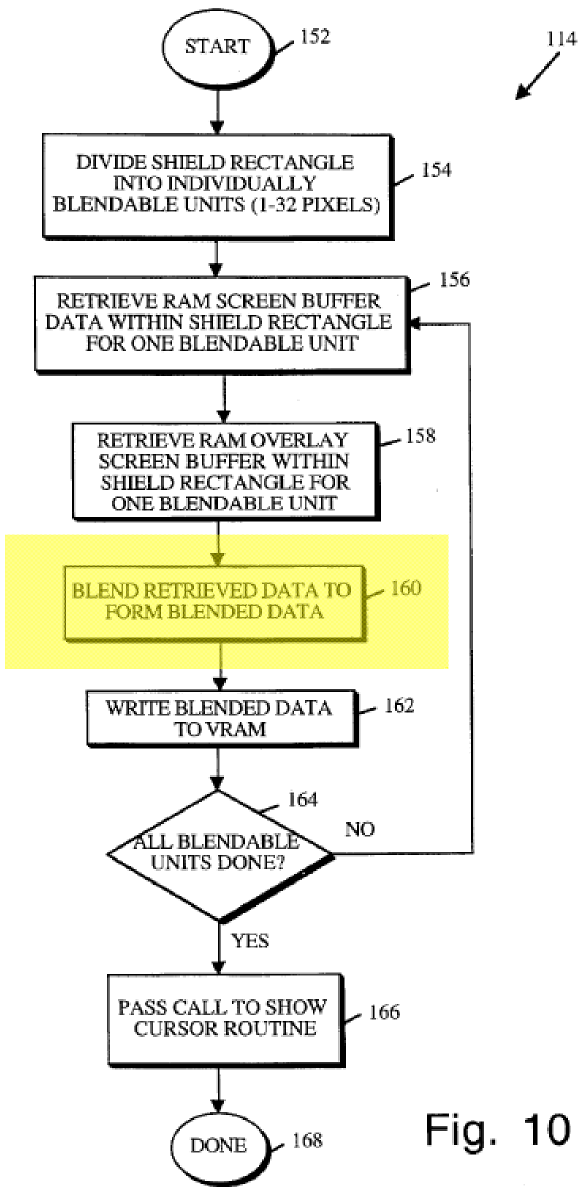


Fig. 10

Appx360. Instead, Figure 10 describes the blending step generically: "BLEND RETRIEVED DATA TO FORM BLENDED DATA." This could not be more conclusory. In view of this generic disclosure of the blending function, a skilled artisan could not conclude that the blending function uses logical operators. *Id.* Further, the disclosure of individually "blendable units" that "can be anywhere in the range of 1 to 32 pixels" and the use of various "RAM screen buffers" does not expressly, implicitly, or inherently disclose that the blending function uses logical operators. Appx1112 ¶ 67.

The Petition also cited the following description of Figures 10A-10F:

> FIGS. 10A-10F are used, as an example, to further explain the process 114 of FIG. 10. FIG. 10A represents the RAM shield buffer within the shield rectangle, and has been divided into 16 individually-blendable units. . . . This "blending" process allows a base image on the screen 40 to be seen through a translucent overlay image produced by the process of the present invention.

Appx59 (citing Appx375 at 10:23-41). This description also omits any disclosure—either express, implicit, or inherent—of logical operators. Appx1011. Further, Figures 10A-10F do not expressly or inherently disclose the use of logical operators for blending:

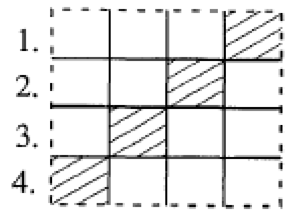


Fig. 10a

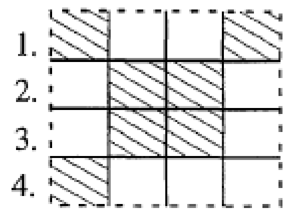


Fig. 10b

Fig. 10c

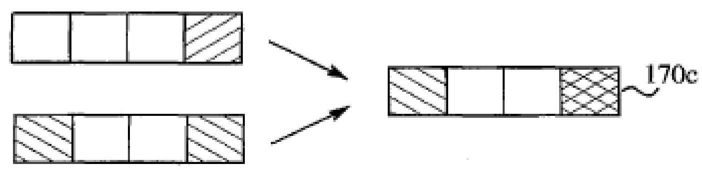


Fig. 10d

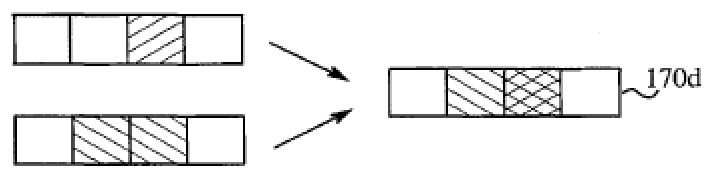


Fig. 10e

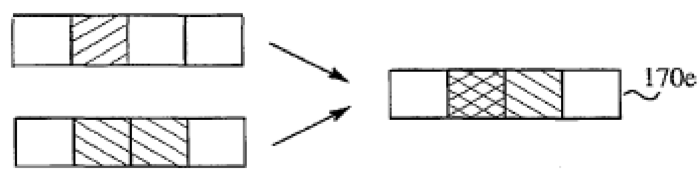
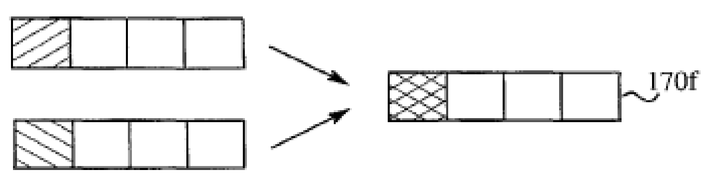


Fig. 10f

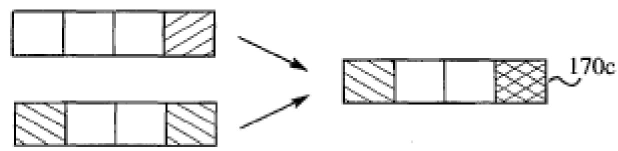


Appx361. These figures illustrate the high-level function of blending, without disclosing any implementation details. For example, the

specification of Gough explains that "[i]n FIG. 10C, the row 1 from FIG. 10A and the row 1 from FIG. 10B are blended together to form a blended row 170C." Appx375 at 10:31-33.

Figure 10C is reproduced below:

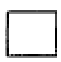
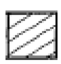
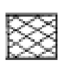
Fig. 10c



Appx361. Figure 10C shows that Figures 10A-10F do ***not*** illustrate a logical OR operation or any other logical operator. Figure 10C instead illustrates that the pixels that make up the four "blendable units" of row 1 of Figure 10A and the pixels that make up the four "blendable units" of row 1 of Figure 10B are blended—in some unspecified manner—to yield a blended image that includes pixels from both Figures 10A and 10B. For example, the rightmost portion of the blended image of row 1 combines the cross-hatch pattern of Figure 10A with the ***different*** cross-hatch pattern of Figure 10B to form ***yet another*** cross-hatch pattern illustrated by blended unit 170c. This illustrated blending of ***two different*** cross-hatch patterns to form a ***third different*** cross-hatch pattern fails to show that the blending function is a simple logical OR operation. As Google acknowledges, a logical OR

operation uses the two binary values 0 and 1, not three different cross-hatch patterns. Br. at 26.

In fact, Figure 10C further illustrates that the blending function is not a simple logical OR operation because it depicts ***at least four*** different cross-hatch symbols whose meanings are undefined by Gough. The following table shows the four different values illustrated by Figure 10C:

Symbol	Description
	Blank
	Cross-hatch pattern **slanting downward** from left to right
	Cross-hatch pattern **slanting upward** from left to right
	Combination of **slanting downward** and **slanting upward** cross-hatch patterns

Therefore, Figures 10A-10F contradict Google's argument that Figures 10A-10F illustrate a logical OR operation. The Gough patent itself is substantial evidence supporting the Board's finding that Figures 10A-10F do not disclose the logical operators limitation.

Dr. Rosenberg's expert testimony further supports the Board's finding that Figures 10A-10F do not disclose the logical operators limitation. Dr. Rosenberg testified that "Gough describes blending

together pixels" but "does not explain how the blending process is performed." Appx1124 ¶ 88. He also testified that the "description accompanying Figures 10A-10F states only that blendable units for the base image are 'blended together' with blendable units for the overlay" but Gough "does not describe using logical operators or Boolean logic." *Id.* ¶ 89.

Google attacks Dr. Rosenberg's testimony as allegedly conclusory. Br. at 27. To the contrary, Dr. Rosenberg analyzed Gough's ***entire*** disclosure of Figures 10A-10F and correctly identified the facts that support his opinion, namely, that Figures 10A-10F only vaguely disclose a process of blending "blendable units" but do not disclose any implementation details of the blending process. Appx1124-1125 ¶ 89. Dr. Rosenberg then correctly concluded from those facts that Gough does not disclose the use of logical operators for blending. *Id.* There was nothing specific in Gough for Dr. Rosenberg to cite to show the absence of logical operators other than reviewing the entire reference. It was Google's burden—not Dr. Rosenberg's—to cite to something in Gough that shows disclosure of logical operators performing a blending operation.

Google's characterization of Dr. Rosenberg's testimony as conclusory confuses alleged brevity with lack of analysis. But any brevity of Dr. Rosenberg's testimony is entirely appropriate because of the sparsity of the disclosure of Gough, rather than any indication that Dr. Rosenberg did not fully analyze the issue. Dr. Rosenberg was not required—and, in fact, it would have been legally improper—to fill in the gaps in Gough's sparse disclosure to speculate how Gough might have intended to implement the blending function. Dr. Rosenberg correctly concluded that Gough simply does not disclose anything about how the blending function is implemented and, thus, a skilled artisan could not conclude that the blending function uses logical operators.

Accordingly, substantial evidence supports the Board's finding that Figures 10A-10B of Gough do not disclose the use of logical operators for blending.

b. Figures 18-19 do not disclose logical operators.

Google's Petition also included a "*see also*" citation to Column 14, lines 5-19 of Gough. Appx59. Those lines of Gough describe an embodiment illustrated by Figures 18 and 19, in which a "color look-up table (CLUT)—not shown—of CSC 307 is loaded with 256 entries which

detail each possible combination of bits from the 4 bit screen and the 4 bit overlay, and what the resultant blended value is." Appx377 at 14:13-16.

This portion of Gough discloses only that a "look-up table" is used to determine the "resultant blended value" for a once-again ***unspecified*** blending function. Appx1021-1022, Appx1124-1125 ¶ 89. This disclosure does not disclose that the underlying blending function encoded into the look-up table is a logical function. *Id.* As Google's expert testified, a look-up table is simply a table that "defines the output value for every possible combination of input values." Appx570 ¶ 63. While Google's expert also testified that "logical operators ***can be*** implemented equivalently using a look-up table," this does not mean that ***every*** look-up table ***necessarily*** implements logical operators. Indeed, Mr. Ward conceded on cross-examination that a look-up table can define a "particular output" for each "combination[] of input values." Appx1863 at 30:10-23. This necessarily means that a look-up table can define any arbitrary function—including arithmetic and other non-logical operators. Appx1124-1125 ¶ 89. Using Mr. Ward's express

definition of a look-up table, the following examples illustrate hypothetical look-up tables that use non-logical operators:

Example 1: Most Populous States Look-up Table	
Input (Rank)	**Result**
1	California
2	Texas
3	New York
4	Florida
5	Illinois

Example 2: Multiplication Look-up Table		
Input 1	**Input 2**	**Result**
0	0	0
0	1	0
0	2	0
. . .	. . .	. . .
9	7	63
9	8	72
9	9	81

Accordingly, Gough's disclosure that it uses a look-up table for blending does not mean that Gough uses logical operators for blending. *Id.*; Appx1021-1022. One cannot know whether a particular look-up table encodes logical operators without knowing the underlying function that the look-up table implements. Appx1124-1125 ¶ 89. Here, because Gough does not disclose the underlying function that its look-up table implements, a skilled artisan could not conclude that Gough's look-up

table implements logical operators for blending. *Id.* Indeed, the Petition—which merely includes a "*See also* 14:5-19" citation to Gough—does not even assert that Gough's look-up table necessarily uses logical operators for blending. *See* Appx59.

Dr. Rosenberg's testimony further supports the Board's finding. Dr. Rosenberg testified that "Gough describes that . . . a color look-up table 'with the resultant blended value[s]' is used to quickly determine the blended value for the pixel" but the "description in Gough in connection with Figures 18 and 19 does not describe using logical operators or Boolean logic." Appx1124-1125 ¶ 89. He further testified that there "are various different ways to blend images together," including Buxton's alpha blending, "which as explained below does not use logical operators or Boolean logic." *Id*. These facts support Dr. Rosenberg's conclusion that Gough's sparse disclosure does not expressly or inherently disclose logical operators for blending.

Google's attempt to dismiss Dr. Rosenberg's testimony as allegedly conclusory again misses the mark for the same reasons discussed above. Dr. Rosenberg analyzed the entirety of Gough's sparse disclosure of a color look-up table and concluded, correctly, that the mere disclosure of

a color look-up table for blending does not show that Gough uses logical operators for blending.

Accordingly, substantial evidence supports the Board's finding that Figures 18-19 of Gough do not disclose the use of logical operators for blending.

2. <u>Google's Reply did not establish that Gough expressly or inherently discloses the use of logical operators for blending.</u>

a. <u>Google's Reply included improper new evidence that should be disregarded.</u>

As explained above, Google's Petition did not make a *prima facie* showing that Gough discloses the "logical operators" claim limitation. In its Reply, Google attempted—but failed—to remedy that deficiency by introducing new testimony of Mr. Ward, Google's expert. Appx1175-1177, Appx1215-1218 ¶¶ 47-52. In his new testimony, Mr. Ward attempted to fill in the gaps of Gough's sparse disclosure with his unsubstantiated opinions that a skilled artisan would understand Figures 10A-10F and 18-19 to disclose the "logical operators" limitation. Significantly, Mr. Ward did not cite to any teaching of Gough or to any extrinsic evidence to support his opinions. He simply asserted—without

evidentiary support of any kind—that the sparse disclosure of Gough teaches the "logical operators" limitation. Appx1215-1218 ¶¶ 46-52.

Google's new Reply evidence failed—both procedurally and substantively—to remedy the deficient Petition. The new Reply evidence failed procedurally because it was introduced too late to meet Google's burden to make a *prima facie* showing of anticipation in the Petition. Appx2038-2039. As the Board correctly found, "Petitioner does not explain adequately where the detailed analysis set forth in the Reply is made in the Petition." Appx15. The Board properly found that Google did not meet its burden to prove anticipation on that basis, and this Court may affirm that finding on that basis alone. The Board also considered the new Reply evidence and found, in the alternative, that it was not persuasive. *Id.*

The AIA statute and regulations establish IPR as a front-loaded process in which a petitioner must at least make a *prima facie* showing of unpatentability in the petition itself. The statute states that a petition may only be considered if it "identifies, in writing and with particularity," each patentability challenge and "the evidence"—including the printed prior art and any expert declarations—supporting

each challenge. 35 U.S.C. § 312(a)(3). Further, the Director's statutory authority to provide "the petitioner with at least 1 opportunity to file written comments" (35 U.S.C. § 316(a)(13)) does not envision a petitioner submitting, for the first time in its Reply, the evidence necessary to make a *prima facie* showing of unpatentability.

Indeed, the Director's implementation of her authority to allow petitioners to "file written comments" expressly prohibits the filing of new Reply evidence necessary to make a *prima facie* showing of unpatentability. The IPR regulations require each petition or motion to include a "full statement of the reasons for the relief requested, including a detailed explanation of the significance of the evidence." 37 C.F.R. § 42.22(a)(2). The regulations further provide that "[a]ll arguments for the relief requested in a motion must be made in the motion. A reply may only respond to arguments raised in the corresponding opposition . . . or patent owner response." 37 C.F.R. § 42.23(b). Further, the Board's stated practice is to disregard replies that include new evidence necessary to support a *prima facie* case of unpatentability:

> A reply may only respond to arguments raised in the corresponding opposition. § 42.23. While replies can help

> crystalize issues for decision, ***a reply that*** raises a new issue or ***belatedly presents evidence will not be considered*** and may be returned. . . . Examples of indications that a new issue has been raised in a reply include ***new evidence necessary to make out a prima facie case*** for the patentability or unpatentability of an original or proposed substitute claim, and ***new evidence that could have been presented in a prior filing***.

Office Patent Trial Practice Guide, 77 Fed. Reg. 48756, 48767 (Aug. 14, 2012) (emphasis added).

Here, even if Mr. Ward's new reply testimony supported a *prima facie* showing of unpatentability—which it does not—the new evidence violated the Board's prohibition of new reply evidence necessary to make such a *prima facie* showing. The new reply evidence was properly discounted by the Board on that basis alone. Appx15-16. In addition, Mr. Ward's new reply testimony "could have been presented in a prior filing"—namely, the Petition—and, thus, it was properly discounted on that basis.

Seeking to excuse Google's failure to provide his belated opinion testimony in Google's Petition, Mr. Ward testified that he "never contemplated that Dr. Rosenberg (and Patent Owner) would take the position that the use of look-up tables, such as disclosed in Gough, did <u>not</u> involve logical operations and operators." Appx1215-1216 ¶ 48 n.3

(emphasis in original). But Mr. Ward's purported failure to recognize Gough's unmistakable lack of disclosure of the "logical operators" limitation does not make IV's reliance on that lack of disclosure unforeseeable. Gough on its face does not disclose the "logical operators" limitation—an express limitation in the challenged claims. Appx1124-1125 ¶ 89. The Board should not be faulted for recognizing that Google failed to timely submit expert testimony in support of its belated (and incorrect) argument that look-up tables inherently implement logical operators.

IV is aware that this Court has held that the Board's consideration of new reply evidence does not necessarily violate the Administrative Procedure Act ("APA"). *Genzyme Therapeutic Products Ltd. Partnership v. Biomarin Pharm. Inc.*, 2015-1720, 2016 WL 3254734, at *3-*6 (Fed. Cir. June 14, 2016). However, that the Board ***may*** consider new reply evidence when it is introduced consistent with the IPR regulations does not ***require*** the Board to do so in contravention of its own rules and practices. Indeed, the case-dependent flexibility enunciated in *Genzyme* does not negate the Board's discretion to disregard new reply evidence when it is introduced in violation of the

Board's prohibition against new reply evidence that is either necessary to make a *prima facie* showing of unpatentability or could have been presented with the Petition. Moreover, IV did not fail to use the available "procedural mechanisms either to respond to evidence raised in the petitioner's reply or to move to exclude it." *Id.* at *6. Indeed, IV "requested [a] conference call to seek guidance concerning its contention that Petitioner's Reply contains improper arguments and evidence." Appx1582. After the call, the Board authorized IV to file a two-page paper identifying improper Reply arguments and evidence, and authorized Google to file a two-page response. Appx1582-1583. IV followed the procedure ordered by the Board. *See* Appx2037-2040.

In view of the foregoing, the Board properly discounted Google's new reply evidence. The Board's finding of no anticipation by Gough should be affirmed on that independent basis.

b. <u>Substantial evidence supports the Board's finding of no anticipation even if Google's new Reply evidence is considered.</u>

Google's new reply evidence also fails substantively to show that Gough discloses the "logical operators" claim limitation. Accordingly,

this Court should affirm the Board's finding of no anticipation even if Google's belated reply evidence is considered.

Here, the Board's finding of no anticipation does not rely solely on Google's failure to prove anticipation in the Petition. The Board considered Google's new Reply evidence in the alternative, but "did not find the arguments persuasive." Appx15. Substantial evidence supports the Board's finding of no anticipation even when Google's new reply evidence is considered.

As explained above, Gough includes only a very high-level disclosure of blending that does not expressly or inherently disclose the use of logical operators. In its Reply, Google attempted to fill in the gaps with Mr. Ward's unsubstantiated conclusion that a skilled artisan would understand that Gough's blending function uses logical operators. Appx1175-1177. But the Board correctly found that Mr. Ward's testimony did not show that Gough discloses the use of logical operators for blending but merely suggests "how Gough *could* be envisioned as using logical operators." Appx16 (emphasis in original). Substantial evidence supports the Board's finding.

In an attempt to create a legal error where none occurred, Google insinuates that the Board applied an incorrect anticipation standard to require ***verbatim*** disclosure of the words "logical operators." Br. at 28. The Board's actual decision, however, disproves this incorrect insinuation. The Board recited the correct standard that a "patent claim is anticipated if a single prior art reference expressly or inherently discloses every limitation of the claim." Appx15-16. The Board then found that Google's arguments, at best, only "suggest how Gough *could* be envisioned as using logical operators, but do not explain adequately where or how Gough expressly discloses using logical operators to carry out the blending process." *Id.* at 16 (emphasis in original). The Board's finding that Google's arguments, at best, "suggest how Gough *could* be envisioned as using logical operators" shows that Google did not meet the requisite standard for proving inherent disclosure—namely, that Gough ***necessarily*** uses logical operators.

The Board also demonstrated that it did ***not*** require verbatim disclosure by finding that both Gough and Buxton disclose multiple claim limitations—such as a "variable-pixel control"—even though those references do not recite those claim limitations verbatim. Appx19-

20, 26-27. Further, contrary to Google's assertion that the Board focused solely on Gough's text and not its figures, the Board included a copy of Figures 10A-10F into its decision and addressed Google's argument that Figures 10A-10F purportedly disclose the "logical operators" limitation. Appx13-16.

Accordingly, despite Google's effort to manufacture a legal error, this is a garden-variety substantial evidence case. The Board applied the correct anticipation standard but made reasonable (and correct) factual findings that Google simply does not like. Google effectively asks this Court to reweigh the evidence and reach a different result. Not only would such a re-weighing of the evidence be improper for an appellate court, but the very evidence on which Google relies shows that the Board's finding—that one ***could*** envision using logical operators with Gough but that Gough does not ***necessarily*** use logical operators for blending—is reasonable. This Court should not accept Google's invitation to second-guess the Board's reasonable factual findings under the substantial evidence standard.

Google asserts that "Figures 10a through 10f in Gough expressly disclose the use of a logical OR operator to blend the pixels of two

images." Br. at 26. Google further asserts that Figures 10A-10F show that "[a] pixel in the blended row is 'off' when the corresponding pixel is 'off' in both input rows, and a pixel in the blended row is 'on' if the corresponding pixel is 'on' in either input row." *Id.* Google's assertions are incorrect and are unsupported by the evidence cited by Google—or any other evidence of record. Indeed, as explained above in Section V(B)(1)(a), Figures 10A-10F actually illustrate ***at least four*** possible values for each box, not just the two binary values—0 and 1—that a logical OR operation would use. Therefore, the figures actually contradict Google's argument that they illustrate a logical (binary) OR operation.

Further, contrary to Google's assertion, the testimony of Google's expert, Mr. Ward, does not support the argument that Figures 10A-10F disclose the outcome of a logical OR operation. Br. at 26. Mr. Ward did not rely on the actual disclosure of Gough. He went beyond Gough's disclosure to ***speculate*** how one ***might*** implement the blending function illustrated by Figures 10A-10F of Gough. Mr. Ward testified that "[i]t would be readily apparent . . . that the simplest and fastest ways to combine the pixels would be with a simple logical operation

such as OR." Appx1216-1217 ¶ 50. But whether one would find a "logical operation such as OR" to be simple or fast is irrelevant to the ***anticipation*** challenge Google relied on. The only relevant question is whether Gough discloses (expressly or inherently) the use of logical operators for blending, and it does not.

Mr. Ward's testimony that Figures 10A-10F "suggest an OR operation" relies entirely on a made-up example that is not disclosed in Gough. Mr. Ward conceded that he ***assumed*** facts not disclosed in Gough to make his speculative theory work:

> For example, ***assume*** the unblended pixels are 2-bit pixels and the unblended pixels in the two rows of Fig. 10C are:
>
> 00 00 00 01
>
> and
>
> 10 00 00 10
>
> A bitwise OR operation yields the following blended row, just as is shown at 170c:
>
> 10 00 00 11.

Appx1217 ¶ 51 (emphasis added). But Gough does not disclose any bit strings of any kind, let alone the litigation-crafted 2-bit strings "00 00 00 01," "10 00 00 10," and "10 00 00 11." That is why Mr. Ward had to "***assume***" (*i.e.*, create) them in an attempt to support his made-

from-whole-cloth anticipation theory. But an anticipation finding cannot rely on assumptions and fabrications not found in the allegedly anticipating reference; anticipation requires actual disclosure, either express or inherent. The Board properly agreed with IV's and Dr. Rosenberg's interpretation of the evidence—which is consistent with the actual disclosure of Gough—rather than relying on Mr. Ward's newly crafted assumptions.

Google also faults the Board for concluding that Gough's disclosure of a look-up table does not inherently disclose the use of logical operators. Br. at 29-30. In his new reply testimony, Mr. Ward makes a sweeping generalization—unsupported by any evidence—that a color look-up table ***always*** implements logical operators but not arithmetic operators. Appx1215, ¶ 47. That testimony is simply inaccurate, and it is contradicted by other evidence of record, including Mr. Ward's own testimony on cross-examination. Appx1863 at 30:10-23. Indeed, as explained above in Section V(B)(1)(b), the evidence shows that a color look-up table ***could*** implement logical operators but does not ***necessarily*** implement logical operators, just as the Board concluded.

Mr. Ward testified on cross-examination that a look-up table simply defines a "particular output" for each "combination[] of input values" in tabular form. *Id.* This testimony repudiates the notion that a look-up table ***necessarily*** implements logical operators. Indeed, this testimony shows that a look-up table can implement ***any arbitrary*** function, including arithmetic and other non-logical functions.

Mr. Ward's testimony further undermines Google's ***anticipation*** argument by attempting to introduce a backdoor ***obviousness*** attack that was not a basis of the IPR proceeding—either as alleged by Google in its Petition or as instituted by the Board. Mr. Ward testified that "[i]mplementing Boolean/logical functions and operators using look-up tables was well-known in the art." Appx1215-1216 ¶ 48. But that statement is irrelevant to the ***anticipation*** challenge that Google chose to rely on in its IPR patentability challenge. The only question relevant to anticipation is whether ***Gough*** by itself discloses (either expressly or inherently) using a look-up table to implement logical operators. Mr. Ward confirmed that his opinion does ***not*** rely solely on Gough because he cites ***six other references***—but ***not*** Gough—for his assertion that it

was purportedly well-known to use look-up tables to implement logical operators. *Id.*

Mr. Ward further undermines his own credibility by making the fantastical claim that "***there is no possible logical operator*** or combined function of inputs ***that Gough does not disclose***." Appx1216 ¶ 49 (emphasis added). This sweeping testimony cannot possibly be accurate. A reference that barely mentions the blending function and says nothing at all about how that function is implemented cannot possibly disclose every possible logical operator. The Board properly discounted Mr. Ward's self-serving testimony because it was simply not credible.

Accordingly, Mr. Ward's testimony itself is substantial evidence supporting the Board's finding that Gough's color look-up table does not necessarily implement logical operators. Dr. Rosenberg's testimony and Gough's disclosure are additional evidence supporting the Board's finding.

Finally, Google argues that Gough "discloses a blending engine that copies sets of bits from two separate image buffers into the engine." Br. at 30 (citing Appx375 at 9:66-10:11). But the cited disclosure merely

describes retrieving data from memory and writing data to memory. There is no disclosure that these operations are logical operators. Google relies on Mr. Ward's conclusory opinion that the operations are "identical to the 'Source Copy' Boolean operation" (Appx1217-1218 ¶ 52), but Mr. Ward offers no evidentiary support for his conclusion. Indeed, Mr. Ward's unsubstantiated opinion does not even cite Gough or explain the phrasing in Gough that allegedly shows that the disclosed operations are identical to a Source Copy operation.

Further, even if Gough's memory retrieval and write operations could be interpreted to be Source Copy operations, Gough does not disclose that the operations provide "different blending/merging effects." Indeed, Gough discloses that the memory retrieval and write operations are separate steps that occur ***before*** and ***after*** blending. Appx375 at 10:5-11. Specifically, Gough discloses that the data is retrieved, then "[t]he retrieved data . . . is blended to form blended data," then "the blended data is written to VRAM to be displayed on the screen." *Id.*

Further, the challenged '960 Patent explains that a Source Copy operation does not have any blending or merging effects:

> The ***logical operations*** described herein each ***preferably have a different blending or merging effect***. Although

> ***some of them do not have substantive effect***, e.g. they just copy the source in to the destination or just fill it with zeros or ones and are ignorant of what the source and destination have, ***the large majority of these operations can be used to create a number of different effects*** to determine how to mesh the keyboard image and the application output image together.

Appx116 at 5:1-37; Appx2291 (emphasis added). This paragraph demonstrates that not all logical operators "provid[e] different blending/merging effects," as is required by the claims. Importantly, Source Copy is one of the operators that does not provide such effects. Therefore, Mr. Ward's conclusory opinion that Gough discloses a Source Copy operation—even if accepted as true—does not establish that Gough discloses "logical operators for providing different blending/merging effects."

Accordingly, substantial evidence—including Mr. Ward's testimony, Dr. Rosenberg's testimony, and the disclosures of Gough and the '960 Patent—supports the Board's finding that Gough does not disclose the "logical operators" claim limitation. Because the Board's finding is reasonable in view of the evidence, it should be affirmed under the substantial evidence standard.

C. Substantial evidence supports the Board's finding that Buxton does not disclose the "logical operators" for blending limitation.

1. Google's Petition failed to make a *prima facie* showing of obviousness because it did not establish that Buxton discloses logical operators for blending.

The "logical operators" limitation expressly requires the use of "logical operators to provide different ***blending***/merging effects such that ***individual pixels*** . . . can be ***dedicated simultaneously to both the main image and the*** representation of at least one ***key***." Claim 1 (emphasis added). Accordingly, the logical operators must create ***blended*** pixels with contributions from both "the main image" and from the "key." The selection of a pixel entirely from the main image or entirely from the key does not meet this limitation.

Much like its Gough argument, Google's Petition presented virtually no evidence that Buxton discloses logical operators for blending, and thus Google failed to make a *prima facie* showing of obviousness. The Petition merely included conclusory attorney arguments that two separate embodiments of Buxton—the "continuous

algorithm" embodiment and the "discrete algorithm" embodiment—disclose "nearly all" the claim limitations.[1] Appx81-82.

With respect to the "continuous algorithm" embodiment, the Petition asserted in conclusory fashion that Buxton's alpha-blending equation "permits pixels to be 'dedicated simultaneously' to both images in order to produce a composite image." Appx83. The Petition also concluded that Buxton's alpha-blending equation is "one example of an operation using logic operators to provide different blending effects." *Id.* But as IV pointed out in its Patent Owner Response, the Petition offered no evidence that an alpha-blending equation—consisting entirely of ***arithmetic operators***—uses ***logical operators***, as claimed. Appx1032.

With respect to the "discrete algorithm" embodiment, the Petition asserted that Buxton discloses various methods "called dithering, stippling, XORing, and 'screen-door transparency'" for creating "a transparency effect by turning off and on various pixels thereby

[1] Although Google's Petition includes Bier and Harrison in combination with Buxton, Google does not rely on Bier or Harrison to teach logical operators. Appx81-98.

creating a 'mask.'" Appx82. The Petition did not even allege, however, that these discrete algorithms create blended pixels that include contributions from both the background and foreground images, as required by the "logical operators" limitation. *Id.* Moreover, the Petition did not suggest that a skilled artisan could combine the discrete algorithms with the continuous algorithms to create blended pixels using logical operators. *Id.* In fact, the Petition asserted that "Buxton ***contrasts*** discrete algorithms with their continuous counterparts," and, importantly, the Petition quotes Buxton as teaching that the ***continuous*** algorithms—***not*** the discrete algorithms—"create a transparency effect by . . . blending attributes of the foreground pixel with attributes of the background pixel in a predetermined proportion." *Id.* (emphasis added) (citing Appx439-440 at 16:63-17:4). Therefore, the Petition did not allege that Buxton's discrete algorithms use logical operators for blending foreground and background pixels. Appx1033-1034.

Accordingly, Google's Petition failed to make a *prima facie* case that Buxton's continuous or discrete algorithms use logical operators for blending pixels from the main image with pixels from the

representation of a key. In its Reply, Google tried to salvage its deficient Petition by relying on new opinions from its expert, Mr. Ward. First, Google relied on Mr. Ward's new assertion that ***any equation***—even one that is clearly an arithmetic equation consisting solely of the arithmetic operators of addition, subtraction, and multiplication—uses logical operators, thereby rendering the limitation's use of "logical operators" into a nullity. Appx1179-1180 (citing Appx1220 ¶ 59). Second, Google relied on a new opinion of Mr. Ward to attempt to recast the plain disclosure of Buxton—namely, that only the continuous algorithms create blended images—to argue that the discrete algorithms also create blended images. Appx1182 (citing Appx1223 ¶ 63).

Again, Google's new reply evidence failed—both procedurally and substantively—to remedy the deficient Petition. The new reply evidence failed procedurally because it was introduced too late to meet Google's burden to make a *prima facie* showing of obviousness. For similar reasons set forth above, the Court should not disturb the Board's decision to credit IV's evidence rather than Google's belated reply evidence. Further, as explained below, Google's new reply evidence

failed substantively because substantial evidence supports the Board's findings that neither Buxton's continuous alpha-blending equation nor Buxton's discrete algorithms disclose logical operators for blending pixels from the main image and from the representation of a key.

2. It is undisputed that Buxton's disclosed alpha blending uses arithmetic operators.

Both below and on appeal, Google relies primarily on Buxton's alpha-blending equation—the so-called "continuous algorithms"—to assert that Buxton discloses the use of logical operators for blending pixels from the main image and from the representation of a key. Google's reliance on the alpha-blending equation is fundamentally flawed. Although the alpha-blending equation blends foreground and background images to create a composite image, it does not do the blending using "logical operators," as claimed.

Google's argument relies on Buxton's disclosure of the following mathematical alpha-blending equation:

$$I = aI_1 + (1\text{-}a)I_2$$

where I is the resulting color intensity, I_1 is the color intensity of the foreground image, I_2 is the color intensity of the background image, and

α is the specified transparency level between 0 and 1. Appx440 at 17:17-28; Appx1133 ¶ 105.

It is undisputed that this mathematical equation uses ***arithmetic*** operators. Br. at 32-33. The equation specifically uses three arithmetic operators: addition, subtraction, and multiplication. Google characterizes the equation as "an arithmetic equation" and characterizes addition, subtraction, and multiple as "arithmetic operations." *Id.* The Board properly found that arithmetic operators are not logical operators. Appx24. If substantial evidence supports that finding—which it does—Google's concession that Buxton uses arithmetic operators for blending compels affirmance of the Board's finding that Buxton's continuous algorithms do not use logical operators for blending.

3. Substantial evidence shows that Buxton's arithmetic operators are not logical operators.

Google argues that Buxton's arithmetic operators ***are*** logical operators, and that essentially, anything is a logical operator. Br. at 33. Google bases this argument on the theory that, at the lowest level of abstraction, computers perform arithmetic using a series of logical operators. *Id.* The Board considered and rejected this theory in view of

the evidence of record. Appx24. The evidence shows that even computer scientists—who are well aware of how computers work—distinguish between arithmetic and logical operators.

The Board found persuasive that IV's expert, Dr. Rosenberg, established that a skilled artisan ***within the computer field*** would distinguish arithmetic operators from logical operators. *Id.* Dr. Rosenberg explained that Buxton's "equation describes operations that are solely arithmetic rather than logical." Appx1133 ¶ 106. Dr. Rosenberg further explained that "Buxton does not describe or suggest that alpha blending uses logical operators." *Id.*

Dr. Rosenberg based his opinion on an authoritative IEEE (Institute of Electrical and Electronics Engineers) dictionary to support the distinction in the computer field between arithmetic and logical operators. *Id.* This dictionary defines "logical operation" as "any nonarithmetic computer operation," and defines "logic operation" as "[a]ny nonarithmetical operation." Appx1079-1080. These authoritative definitions lend weight to Dr. Rosenberg's testimony and undergird the reasonableness of the Board's reliance thereon. *See* 37 C.F.R. § 42.65(a).

Google's own expert testimony also supports the Board's conclusion. Mr. Ward testified that computers common in the early 1980s had separate categories for arithmetic and logical instructions. Appx1949-1951 at 116:10-118:14. During his cross-examination, Mr. Ward discussed a book titled *Computer Organization and Design*, which describes low-level computer instructions from the "MIPS" system. *Id.*; Appx1820-1825. He acknowledged that MIPS was "typical of instruction sets designed since the early 1980s" and was a "chosen instruction used by . . . Silicon Graphics," the assignee on the face of Buxton. Appx1949 at 116:10-17; Appx422.

MIPS computer instructions are described in the following chart from the book:

MIPS assembly language

Category	Instruction	Example		Meaning	Comments
Arithmetic	add	add	$s1,$s2,$s3	$s1 = $s2 + $s3	Three operands; overflow detected
	subtract	sub	$s1,$s2,$s3	$s1 = $s2 – $s3	Three operands; overflow detected
	add immediate	addi	$s1,$s2,100	$s1 = $s2 + 100	+ constant; overflow detected
	add unsigned	addu	$s1,$s2,$s3	$s1 = $s2 + $s3	Three operands; overflow undetected
	subtract unsigned	subu	$s1,$s2,$s3	$s1 = $s2 – $s3	Three operands; overflow undetected
	add immediate unsigned	addiu	$s1,$s2,100	$s1 = $s2 + 100	+ constant; overflow undetected
	move from coprocessor register	mfc0	$s1,$epc	$s1 = $epc	Used to copy Exception PC plus other special registers
	multiply	mult	$s2,$s3	Hi, Lo = $s2 × $s3	64-bit signed product in Hi, Lo
	multiply unsigned	multu	$s2,$s3	Hi, Lo = $s2 × $s3	64-bit unsigned product in Hi, Lo
	divide	div	$s2,$s3	Lo = $s2 / $s3, Hi = $s2 mod $s3	Lo = quotient, Hi = remainder
	divide unsigned	divu	$s2,$s3	Lo = $s2 / $s3, Hi = $s2 mod $s3	Unsigned quotient and remainder
	move from Hi	mfhi	$s1	$s1 = Hi	Used to get copy of Hi
	move from Lo	mflo	$s1	$s1 = Lo	Used to get copy of Lo
Logical	and	and	$s1,$s2,$s3	$s1 = $s2 & $s3	Three reg. operands; logical AND
	or	or	$s1,$s2,$s3	$s1 = $s2 | $s3	Three reg. operands; logical OR
	and immediate	andi	$s1,$s2,100	$s1 = $s2 & 100	Logical AND reg, constant
	or immediate	ori	$s1,$s2,100	$s1 = $s2 | 100	Logical OR reg, constant
	shift left logical	sll	$s1,$s2,10	$s1 = $s2 << 10	Shift left by constant
	shift right logical	srl	$s1,$s2,10	$s1 = $s2 >> 10	Shift right by constant

Appx1824; Appx2307 (highlighting added). Reviewing this chart, Mr. Ward testified that the MIPS arithmetic instructions were separate from the logical instructions. Appx1950-1951 at 117:23-118:14.

Thus, both Google's and IV's experts—both computer scientists—testified to the distinction between arithmetic and logical operators, based on underlying evidence. Accordingly, the record evidence abundantly supports the Board's conclusion that Buxton's arithmetic operators are not logical operators.

Google's attorney-crafted conclusions are not evidence and do not show that the Board's factual finding lacks substantial evidence.

Google's competing interpretation is based on the theory that all computer-implemented operators are logical operators because they are composed of "building blocks" that are logical operators—that is, all computer instructions are simply combinations of 1s and 0s at their most fundamental level. Br. at 33. This microscopic bits-and-bytes analysis focuses on the wrong question. The relevant question is whether Buxton's arithmetic operators ***as a whole*** are logical operators, not whether they can be composed of basic digital "building blocks" that are logical operators. Google's argument would render the "logical operator" limitation meaningless by collapsing all operators into logical operators—even arithmetic operators, which ***computer scientists*** distinguish from logical operators. That the Board considered the parties' competing interpretations of the evidence and found IV's interpretation to be more reasonable compels affirmance. *In re Becton, Dickinson and Co.*, 675 F.3d 1368, 1373 (Fed. Cir. 2012) ("The possibility that two inconsistent conclusions may be drawn from the evidence does not preclude a Board finding from being supported by substantial evidence.").

4. Substantial evidence shows that Buxton's discrete algorithms do not "provide different blending/merging effects."

On appeal, Google now makes a cursory argument that "Buxton's discrete algorithm method uses logical operators." Br. at 36. Google specifically relies on Buxton's disclosure of "XORing" to create a "mask" for ***selecting*** pixels (as opposed to ***blending*** pixels). *Id.* (citing Appx439 at 16:15-17). Google observes on appeal that the "XOR (exclusive OR) operator is undisputably a Boolean logical operator." Br. at 36. But that observation is both irrelevant and misleading.

The "logical operators" for blending limitation is not satisfied by the mere disclosure of a logical operator that does anything. Rather, the "logical operators" limitation expressly requires a ***specific use*** of logical operators, namely, ***for blending pixels*** "such that ***individual pixels*** can be ***dedicated simultaneously*** to ***both*** the main image and the representation of at least one key." Google's observation that the XOR operator is a logical operator fails to address the entire claim limitation. *See* Br. at 20. Indeed, Google's appeal brief—and both its Petition and Reply below—are devoid of any evidence that Buxton's discrete algorithms use logical operators ***for the claimed function***, namely, for

blending pixels from the main image and the representation of a key to form a composite image.

In fact, Google's Petition acknowledged that it is the continuous algorithms of Buxton—***not*** the discrete algorithms—that "create a transparency effect by . . . blending attributes of the foreground pixel with attributes of the background pixel in a predetermined proportion." Appx82 (citing Appx439-440 at 16:63-17:4). Further, Buxton discloses that its discrete algorithm "mask" only ***selects*** each pixel from two options—the foreground image and the background image:

> Mask bits which are "on" ***select*** an associated pixel from a foreground image; mask bits which are "off" ***select*** an associated background image pixel. Accordingly, masks always work using a binary decision criteria.

Appx439 at 16:20-23 (emphasis added). This selection of pixels from one of the two images—without blending foreground and background pixels—does not meet the requirement of the logical operators for blending limitation, "such that ***individual pixels*** can be ***dedicated simultaneously*** to ***both*** the main image and the representation of at least one key." Appx1035 (emphasis added). Rather, Buxton's selection of each pixel from either the foreground image or the background image

ensures that each individual pixel is dedicated to ***only*** one of the images, but ***not both***.

Dr. Rosenberg's testimony confirms that Buxton's discrete algorithms do not allow individual pixels to be dedicated simultaneously to both the main image and the representation of a key. Appx1134-1135 ¶¶ 107-109. Dr. Rosenberg also established that the '960 Patent was allowed over a Bartlett reference that discloses a bit mask selection process almost identical to Buxton's discrete algorithm. Appx1131-1132 ¶ 103. The '960 Patent was properly allowed over Bartlett, and remains patentable over Buxton, because the bit mask selection processes of Bartlett and Buxton do not allow individual pixels to be dedicated simultaneously to both the main image and the representation of a key. Appx1035-1037.

Accordingly, substantial evidence, including Buxton's disclosure and Dr. Rosenberg's testimony, supports the Board's finding that the claims are patentable over the Buxton, Bier, and Harrison combination.

To the extent that Google attempts to use its reply brief on appeal to introduce yet another new obviousness theory—namely, that it would have been obvious to combine Buxton's discrete algorithm embodiment

with its continuous algorithm embodiment—this attempt should be rejected. First, Google never made this argument below, and, thus, it waived the argument. Second, Google's Petition acknowledged that "Buxton ***contrasts*** discrete algorithms with their continuous counterparts" (Appx82 (emphasis added)), and teaches that the ***continuous algorithms*** are used for blending. Third, Google did not introduce any evidence that a skilled artisan would have any reason to modify—or any expectation of success in modifying—the discrete algorithm to perform blending or the alpha-blending equation to use logical operators instead of arithmetic operators. This Court should neither make its own findings of fact nor fill in the gaps in Google's evidence. *See Golden Bridge Tech., Inc. v. Nokia, Inc.*, 527 F.3d 1318, 1323 (Fed. Cir. 2008) ("We decline to determine what a prior art reference discloses, a fact finding, in the first instance on appeal. Appellate courts review district court judgments; we do not find facts."). Rather, because substantial evidence supports the Board's factual finding that Buxton does not disclose the use of logical operators for blending pixels from the main image and the representation of the key, this Court should affirm the Board's factual finding.

D. <u>**The Board's finding that Buxton does not disclose the "logical operators" limitation necessarily leads to the Board's non-obviousness conclusion.**</u>

1. <u>**Google failed to meet its burden to prove obviousness.**</u>

Google bears the burden to prove obviousness. *In re Magnum Oil Tools*, 2016 WL 3974202, at *6. Google attempted to meet this burden with the combination of Buxton, Bier, and Harrison. Google alleged that Buxton—and no other reference within the combination—discloses the logical operators limitation. Appx90 (citing only Appx439-440 at 16:1-17:33). The Board's finding that Buxton does not disclose the logical operators limitation necessarily means that no reference within the combination discloses the logical operators limitation. Therefore, Google failed to meet its burden to prove obviousness.

2. <u>**The Board properly declined to *sua sponte* consider an obviousness argument that Google did not make below.**</u>

Google argues that the Board failed to determine "whether it would have been obvious to one skilled in the art to 'bridge the differences'" between Buxton's use of arithmetic operators for blending and the claimed use of logical operators for blending. Br. at 37. Google further argues that it would have been obvious to modify Buxton to use logical operators—instead of arithmetic operators—for blending based

on the knowledge of one of skill in the art. *Id.* Google also criticizes the Board for failing to take into account the alleged "extensive background knowledge that a skilled programmer would employ." *Id.* at 38 (internal quotations omitted). But Google cannot properly fault the Board for not considering this argument that Google did not make below and, accordingly, that Google did not provide ***any*** evidence to support. Therefore, Google waived its new-on-appeal obviousness argument. And the Board cannot be faulted for not *sua sponte* considering an argument that Google never made.

This Court "is an appellate court [that] . . . abide[s] by the general rule that new arguments will not be decided in the first instance on appeal." *Golden Bridge*, 527 F.3d at 1323. Further, because appellate courts "review . . . judgments," but "do not find facts," this Court should decline to make fact findings—such as the underlying factual considerations necessary to support an obviousness determination—"in the first instance on appeal." *Id.* Moreover, this Court confines its review of a Board decision to the "four corners" of the record below—namely, "the arguments and evidence presented by the parties." *In re Watts*, 354 F.3d 1362, 1367 (Fed. Cir. 2004). Each party to a Board

proceeding has a "full 'opportunity to bring forth the facts thought necessary to support his or her position.'" *Id.* (citation omitted). It is important that the parties "not be permitted to raise arguments on appeal that were not presented to the Board." *Id.*

It is unfair for a party to use an "iterative process" in which it presents some of its arguments to the Board "and then, only after those arguments have been completely rejected, bring[s] entirely different arguments on appeal for the first time." *Golden Bridge*, 527 F.3d at 1322. In view of such policy concerns, this Court generally finds that an argument raised on appeal for the first time is waived, "absent limited circumstances." *Id.* at 1322-23. These ***limited circumstances*** include when there has been a change in the controlling law or when waiver is not strictly applied against a party who appeared *pro se* below. *Id.* at 1323. Waiver also occurs when a party makes only a "skeletal argument" below. *CBOCS W., Inc. v. Humphries*, 553 U.S. 442, 461 n.2 (2008); *SmithKline Beecham Corp. v. Apotex Corp.*, 439 F.3d 1312, 1320 (Fed. Cir. 2006) (citing numerous appellate holdings that undeveloped or skeletal arguments do not avoid waiver); *United States v. Dunkel*,

927 F.2d 955, 956 (7th Cir.1991) ("Judges are not like pigs, hunting for truffles buried in briefs.").

Google did not make its new obviousness argument below. Indeed, Google repeatedly insisted below that there are ***no*** differences between Buxton's arithmetic operators and logical operators. In its Petition, Google argued that Buxton's alpha-blending equation is "an operation using logic operators to provide different blending effects." Appx83. Even after IV demonstrated that Buxton discloses ***arithmetic*** operators rather than ***logical*** operators—and that the two types of operators are different—Google remained steadfast in its Reply that Buxton's "[a]lpha blending . . . uses logical operators to provide different merging effects," and that "multiplication, addition, or subtraction . . . ***are*** logical operators in a computer." Appx1179-1180 (emphasis added). Finally, at the oral hearing, Google argued that, "under the correct interpretation of logical operator," Buxton's alpha-blending equation "would satisfy the claim language." Appx2359 at 34:20-25.

At no point below did Google argue that there are ***any*** differences between Buxton's arithmetic operators and the claimed logical operators.

Google made a strategic choice to deny any differences between arithmetic operators and logical operators, and Google never made an alternative argument that it would have been obvious to modify Buxton to use logical operators for blending instead of arithmetic operators. In view of its strategic choice in this regard, it is not surprising that Google did not introduce any expert testimony—or any other evidence—that it would have purportedly been obvious to make such a modification. It cannot change its mind now. And this Court should not step into the shoes of the Board and decide Google's newly-raised issue afresh on appeal.

Google may attempt to rely on its general obviousness argument, or to vague references it made to obviousness when referring to the logical operators limitation, to avoid waiver. But no reasonable interpretation of the record shows that Google made the argument it makes now—namely, that it would have been obvious to modify Buxton to use logical operators for blending instead of arithmetic operators. Google's general obviousness argument was that Buxton ***itself*** discloses logical operators, and that Bier and Harrison merely disclose other

claim limitations. Appx81-87. Thus, Google cannot avoid waiver by relying on any general obviousness argument.

Further, Google's vague references to obviousness do not set forth the specific argument Google now makes on appeal. At most, Google's Reply includes a vague heading that uses the word "obvious." Appx1179 ("Buxton Renders Obvious . . ."). Similarly, at the oral hearing, Google stated "that the alpha blending equation that's disclosed in Buxton renders all the challenged claims obvious." Appx2364 at 39:12-13. But these vague references to obviousness do not set forth any argument or cite any evidence that it would have been obvious to modify Buxton to use logical operators for blending instead of arithmetic operators. Indeed, because Google continued to deny—both in its Reply and at the oral hearing—that there are ***any*** differences between Buxton's arithmetic operators and the claimed logical operators, Google's references to obviousness cannot fairly be interpreted as an argument that logical operators are merely an obvious substitute for Buxton's arithmetic operators. Appx1179-1182; Appx2364. At best, Google's vague usage of the word "obvious" is a "skeletal" argument that does not avoid waiver. *SmithKline Beecham*, 439 F.3d at 1320.

Google also did not submit evidence of any underlying facts that would have been necessary to support a finding that modifying Buxton would have been obvious. For example, Google never articulated a reason—let alone submit evidence of a reason—that a skilled artisan would modify Buxton to use logical operators for blending instead of arithmetic operators. Google now belatedly attempts—for the first time on appeal—to fit its new obviousness argument into a generic *KSR* rationale. Br. at 38 (alleging a combination of familiar elements according to known methods); 39 (alleging interchangeability of logical operators and arithmetic operators); 40 (alleging obviousness to try). But a determination that any of those *KSR* rationales apply would require underlying facts that Google did not prove. This Court should not make those factual findings on appeal. *Golden Bridge*, 527 F.3d at 1323.

Google may assert that it submitted documents related to logical operators and arithmetic operators, and that the Board should have *sua sponte* dug through those documents in an attempt to find evidence of obviousness. Any such assertion would be incorrect, however, for at least two reasons. First, while Google submitted very general

descriptions of logical operators and arithmetic operators, it submitted no evidence that a skilled artisan would consider logical operators to be an obvious substitute for Buxton's alpha-blending equation. Appx1180. Second, Google cited the evidence solely in support of its argument that arithmetic operators are the same as logical operators, but never argued that logical operators would have been an obvious substitute for Buxton's alpha-blending equation. *Id.* The Board properly evaluated the arguments and supporting evidence and concluded that the evidence does not prove the assertion for which Google cited it. Appx24. The Board was not required to dig through the evidence in a speculative and one-sided search to determine whether the Board might be able to devise an obviousness argument that Google did not make. This Court also should decline Google's invitation to scour the evidence anew and find facts that Google did not assert below.

On appeal, Google attempts to recast some of the documents as purportedly supporting a vague and conclusory assertion that "[l]ogical operators are ubiquitous in computer science: they are the basic building blocks of computer processing and the essential tools of a computer programmer." Br. at 38. But Google never made this

argument—or alleged that the evidence supported it—below. Thus, Google waived the argument. Further, the Board could not have accepted such a conclusory assertion as evidence that it would have been obvious to replace Buxton's arithmetic alpha-blending equation with logical operators. *See K/S HIMPP v. Hear-Wear Techs., LLC*, 751 F.3d 1362, 1366 (Fed. Cir. 2014) ("the Board cannot accept general conclusions about what is 'basic knowledge' or 'common sense' as a replacement for documentary evidence for core factual findings in a determination of patentability."); *Arendi S.A.R.L. v. Apple, Inc.*, No. 15-2073, 2016 WL 4205964, at *5 (Fed. Cir. Aug. 10, 2016).

Google improperly blames IV and the Board for not rebutting Google's new appeal argument that it would have been obvious to modify Buxton to use logical operators for blending instead of arithmetic operators. Br. at 38. Specifically, Google suggests that IV and the Board should have identified "any unexpected result from the patent's use of logical operators." *Id.* But neither IV nor the Board can properly be required to rebut an argument that Google never made. Google chose to rely exclusively on the argument that Buxton—alone and without modification—teaches the use of logical operators for

blending. The Board explicitly and properly rejected this argument after finding that Buxton's arithmetic operators are not logical operators. Appx24. Because the Board's finding is supported by substantial evidence, the Board's necessary conclusion that Google failed to prove obviousness should be affirmed.

Google's argument improperly faults the Board for not *sua sponte* substituting a different obviousness argument and evidence for the argument and evidence on which Google chose to rely. The cases cited by Google do not require the Board to consider obviousness arguments and evidence that Google did not present below. The cases simply confirm that claims are obvious when the differences between the claims and the prior art are "not so great as to render the system nonobvious to one reasonably skilled in the art." *Dann v. Johnston*, 425 U.S. 219, 230 (1976); *see Ohio Willow Wood Co. v. Alps South, LLC*, 735 F.3d 1333, 1343 (Fed. Cir. 2013); *see also Scanner Techs. Corp. v. ICOS Vision Sys.*, 528 F.3d 1365, 1382 (Fed. Cir. 2008). While these cases establish the level of proof that Google would have had to meet ***if it had tried*** to prove that it would have been obvious to replace Buxton's arithmetic operators with logical operators, they do not relieve Google of

the burden of making the argument or of submitting supporting evidence.

Google cites no legal authority—and IV is not aware of any—that would require or even allow the Board to *sua sponte* find claims obvious based on arguments and evidence not presented below. Here, because Google never even argued—let alone proved—that it would have been obvious to modify Buxton to use logical operators for blending, the Board properly declined to *sua sponte* consider the new obviousness theory that Google only now presents on appeal.

Moreover, the cases do not obligate this Court to *sua sponte* conduct its own obviousness analysis—and make its own findings of fact—based on speculation about what Google possibly could have proved had it tried. Google tacitly acknowledges that Google did not complete a proper obviousness analysis—or meet its burden of proof—by urging this Court to "complete the analysis." Br. at 41. But this Court should not step into the shoes of a skilled artisan to surmise what the skilled artisan might have found obvious had Google made out its case below. *See Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 837 (2015) ("[A]ppellate courts must constantly have in mind that their

function is not to decide factual issues *de novo*.") (citation omitted); *see also Golden Bridge*, 527 F.3d at 1323.

Because Google never even argued nor proved that modifying Buxton to use logical operators for blending—in place of Buxton's arithmetic operators—would have been obvious, this Court should affirm the Board's judgment of non-obviousness.

E. The Board properly rejected Google's estoppel argument.

Google alleges that IV has asserted the '960 Patent against devices that use a form of alpha blending, and that IV's argument that Buxton's alpha blending uses arithmetic operators is inconsistent with that assertion. Br. at 34-35. Based on that allegation, Google argues that the Board should have found that IV was estopped from arguing that Buxton's alpha-blending equation uses arithmetic operators. Br. at 35. The Board considered that argument and correctly found that IV is not estopped "because Patent Owner has not succeeded on its infringement claim in district court." Appx25. This legal determination is unquestionably correct as a matter of law. *See U.S. Philips Corp. v. Sears Roebuck & Co.*, 55 F.3d 592, 598 (Fed. Cir. 1995) (collateral estoppel requires final judgment). Further, the Board reiterated its

factual finding that "arithmetic operations are not the same as logical operations." Appx25.

Nevertheless, Google appears to suggest that the Board should have invented a new form of estoppel. Specifically, Google suggests that the Board should have examined IV's infringement contentions to construe "logical operators" or interpret the prior art. Br. at 34-35. This suggestion is incorrect. Infringement contentions are not relevant evidence of the proper interpretation of claims or prior art. Moreover, even if infringement contentions were minimally relevant, the Board is not well-equipped to conduct a mini-trial to determine the precise nature of the accused products. Thus, an attempt to examine infringement contentions is more likely to mislead than to enlighten.[2]

The cases cited by Google do not suggest otherwise. Here, as always, the Board construed the claims for the sole purpose of

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[2] Further, IV disputes Google's characterizations of IV's infringement contentions, in which IV cited to algorithms that relied on logical operators to perform the accused blending operations. Google's arguments about IV's extensive infringement contentions are misleading at best, and highlight the problem of requiring the Board to review and render factual findings on district court litigation proceedings.

determining patentability, and, thus, it did not violate the principle that claims cannot be construed more broadly for infringement than for patentability. It is up to district courts to construe the claims for infringement, taking into account, if appropriate, the Board's claim construction. Further, the unique facts of *Vanmoor v. Wal-Mart Stores, Inc.*, 201 F.3d 1363, 1366 (Fed. Cir. 2000) are not present here. In *Vanmoor*, the accused infringer asserted that the ***very same products accused of infringement*** were on sale more than one year before the patent filing date. Here, however, Buxton is a patent, not a commercial product, and thus Buxton has not been accused of any infringement.

Accordingly, the Board properly rejected Google's estoppel argument.

F. <u>Any alleged inconsistency between the Board's Institution Decision and its Final Written Decision is not legal error.</u>

1. <u>Google improperly appeals the Board's Institution Decision.</u>

Google alleges that the Board's Institution Decision is inconsistent with its Final Written Decision. Br. at 41. On that basis, Google argues that the Final Written Decision is arbitrary and capricious. Google is incorrect as a matter of law.

Google's argument is a transparent attempt to appeal the Board's decision to not institute an IPR based on the Martin reference. That decision, however, is final and non-appealable. 35 U.S.C. § 314(d); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2139-42 (June 20, 2016). Google insists in a footnote that it is ***not*** challenging the Institution Decision because it alleges the Final Written Decision is defective. Google's argument exalts form over substance. Google's argument necessarily rests on Google's allegation that the Board erred by finding Martin "redundant" Br. at 42-43. But the Final Written Decision did not address redundancy; only the Institution Decision did. Indeed, Google's allegation that the Board erred by finding Martin redundant cites ***only*** the Institution Decision. *Id.* at 42.

Google's reliance on *Ethicon* and *Synopsys* is misplaced. Br. at 42, n. 3. In *Ethicon*, the appellant argued "that the final decision should be set aside because it was made by the same panel that made the decision to institute inter partes review." *Ethicon Endo-Surgery, Inc. v. Covidien LP*, 812 F.3d 1023, 1028. In *Synopsys*, the petitioner appealed the Board's failure to address all challenged claims in the final decision. *Synopsys, Inc. v. Mentor Graphics Corp.*, 814 F.3d 1309, 1313-14. Here,

by contrast, Google challenges the Institution Decision's substantive finding of redundancy. Br. at 42.

Google's challenge is the kind of garden-variety or "mine-run" challenge precluded by *Cuozzo*. *See Cuozzo*, 136 S. Ct. at 2136. The Board's finding of redundancy comports with its longstanding practice of managing redundant cases to satisfy its Congressional mandate "to timely complete proceedings." *See Liberty Mutual Ins. Co. v. Progressive Casualty Ins. Co.*, Case CBM2012-00003, 2012 WL 9494791, at *1 (citing 35 U.S.C. § 326(b)) (P.T.A.B. Oct. 25, 2012). Google's challenge does not present the types of constitutional issues or "other questions of interpretation that reach, in terms of scope and impact, well beyond 'this section' [of the AIA]" that the Supreme Court hinted may be appealable. *Cuozzo*, 136 S. Ct. at 2141.

Because Google's challenge is nothing more than a thinly-veiled attempt to appeal the Institution Decision, this Court should decline to entertain it.

2. There is no legal inconsistency between the Institution Decision and the Final Written Decision.

The Board's discretionary denial of institution of the Martin ground is not legally inconsistent with the Final Written Decision. The

two decisions decided separate legal issues applying different legal standards. In the Institution Decision, the Board determined whether the Petition had shown that the Martin ground was, in some way, stronger than the Gough and Buxton grounds, and *vice-versa*. Appx889. This decision is consistent with the Board's common practice of denying redundant grounds. *See Liberty Mut.*, 2012 WL 9494791, at *1-*2. The Board finds redundancy when (1) multiple similar references are purported to be distinct alternatives for unpatentability and (2) the petition fails to "explain why one reference more closely satisfies the claim limitation at issue in some respects than another reference, and vice versa." *Id.* at *2 (emphasis omitted).

Consistent with this practice, the Board found that the Petition did not establish that the Martin ground was any stronger because the Petition unequivocally asserted that both Gough and Buxton teach the logical operators limitation. Appx884-889. Thus, based on the information available to the Board, the Board properly exercised its discretion to deny institution of the Martin ground.

The Board's Final Written Decision decided the separate legal issue whether Google proved, by a preponderance of the evidence, that

the challenged claims are unpatentable. In this determination, the Board considered additional arguments and evidence not previously available to it, including, most significantly, IV's Patent Owner Response and the evidence submitted therewith. As explained above, the Board properly determined that neither Gough nor Buxton discloses the "logical operators" limitation.

Because the two decisions addressed different legal issues and applied different standards, they are not legally inconsistent.

3. **Even if there were an inconsistency, the Board is not, and should not be, bound by its preliminary findings in its Institution Decision.**

By statutory design, the preliminary stage of an IPR is separate from the trial stage. The Board necessarily makes preliminary findings in its Institution Decision to decide the preliminary question whether the petitioner has a reasonable likelihood to prevail in the IPR. In general, the Board's preliminary findings do not carry forward as established fact in the trial stage. Rather, in the trial stage, the Board considers all the evidence of record—much of which was not of record during the preliminary stage—to determine whether the petitioner met

its burden to prove unpatentability. *See Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1364-65 (Fed. Cir. 2016).

Binding the Board to its preliminary findings—or, as Google requests, requiring the Board to explain any alleged inconsistencies—would raise serious due process and judicial efficiency concerns. For example, it would make the Board overly reluctant to reconsider its preliminary findings in the face of evidence presented during the trial stage. This would bias the Board—or at least create a perception of bias—against patent owners, because the preliminary findings of a decision to institute an IPR ground are, by definition, against the patent owner's position.

In addition, requiring the Board to explain alleged departures from its preliminary findings would multiply appeals of issues that are tangential or irrelevant to the Board's final decision. Indeed, it would allow numerous backdoor appeals of non-appealable institution decisions. In particular, in nearly all cases in which the Board finds claims patentable in its final written decision, the petitioner could characterize that decision as inconsistent with the institution decision to justify an appeal of the institution decision.

Here, the Board did not "'change theories in midstream without giving respondents reasonable notice of the change' and 'the opportunity to present argument under the new theory.'" *See SAS Institute, Inc. v. ComplementSoft, LLC*, No. 2015-1346, 2016 WL 3213103, at *7 (Fed. Cir. June 10, 2016) (citations omitted). The Board gave the parties proper notice of the grounds upon which trial was instituted and properly conducted the trial based on the instituted grounds. That Google failed to prove unpatentability at trial is not a valid basis to revisit the Board's Institution Decision.

— INTELLECTUAL VENTURES' CROSS-APPEAL —

VI. STATEMENT OF THE ISSUES

3. Given that claims 19 and 26 of the '960 Patent expressly recite two separate functions (*i.e.*, the selection of pixels and the blending of pixels), did the Board err by construing claims 19 and 26 to require only one of the claimed functions?

VII. STATEMENT OF THE CASE AND FACTS

The PTAB concluded that claims 19-22 and 24-30 are unpatentable over two separate grounds. First, the PTAB held claims 19-22 and 24-30 unpatentable as anticipated by Gough. Appx28. Second, the PTAB held claims 19, 20, 22, and 24-30 unpatentable as obvious over the combination of Buxton, Bier, and Harrison. *Id.* The PTAB based these conclusions on its express construction of claims 19 and 26 to require pixel selection ***or*** pixel blending. *Id.* at 19.

Claim 19 of the '960 Patent recites, in relevant part, the following:

> 19. A method of superimposing a representation of at least one key over a main image provided by a computing device, the method comprising:
>
> (a) using variable-pixel control to form a representation of at least one key, ... ***the variable-pixel control causing pixels <u>selected</u> to form the representation of at least one key***

> ***to be activated simultaneously with pixels <u>selected</u> to form the main image***; and . . . .
>
> wherein the variable-pixel control allows ***individual pixels to be <u>dedicated simultaneously</u> to both the main image and the representation of at least one key***.

In the claimed method, the recited "variable-pixel control" performs at least two claimed functions—at the pixel level—related to forming a composite image of a keyboard key and a main image. First, the variable-pixel control causes "pixels selected to form the representation of at least one key to be activated simultaneously with pixels selected to form the main image" (the "pixel selection" limitation). Second, in a separate claim limitation, the variable-pixel control "allows individual pixels to be dedicated simultaneously to both the main image and the representation of at least one key" (the "pixel blending" limitation). The plain language of claim 19 (and claim 26) requires ***both*** pixel selecting and blending in a single composite image. In contrast, neither Gough nor Buxton teach both selecting and blending in the same composite image.

VIII. SUMMARY OF THE ARGUMENT

The PTAB erred as a matter of law by construing claims 19 and 26 to require either pixel selecting ***or*** pixel blending. The plain language of the claims requires both selecting and blending in the same composite image. Claim 19, for instance, first recites selecting, then uses the phrase "and" to further recite blending. Claim 26 uses parallel language to claim 19. No clear and unambiguous disclaimer exists in the specification to override the plain language. And the prosecution history compels the proper interpretation because the applicant was required to amend claims 19 and 26 to include the pixel blending limitation in addition to the already-recited pixel selection limitation to obtain allowance. Appx265-266. The PTAB's legal conclusion that the claim requires either/or instead of both selecting and blending is simply indefensible and plainly unreasonable.

When this erroneous construction is cast aside, both the PTAB's grounds for unpatentability evaporate. Gough, for instance, teaches only blending, not both selecting and blending. Buxton also fails to teach both selecting and blending in the same composite image. Google did not rely on either Bier or Harrison to remedy Buxton's deficiency.

IX. ARGUMENT

A. Standard of Review

See Section V(A), *supra*.

B. The Board erroneously construed the pixel selection and pixel blending limitations to require only one of them to be performed.

Claim 19's "variable-pixel control" performs at least two claimed functions related to forming a composite image of a keyboard key and a main image. The two separate claimed functions of variable-pixel control combine pixels from a "representation of a key" and from a "main image" in two separate ways to form a composite image. In accordance with its plain meaning, the pixel selection limitation ***selects*** some pixels ***entirely*** from the representation of a key and ***selects*** other pixels ***entirely*** from the main image. The usage of "selected" dictates that the pixel selection limitation does not involve any blending or merging of individual pixels.

The pixel blending limitation, on the other hand, performs the separate function of blending pixels from the main image with pixels from the representation of a key to create blended pixels. In accordance with the plain meaning of allowing "***individual pixels*** to be ***dedicated***

simultaneously to ***both*** the main image and the representation of at least one key," the pixel blending limitation necessarily requires the blending of pixels from the representation of the key with pixels from the main image to create blended pixels. An individual pixel cannot be dedicated to both the main image and the representation of the key unless some of the pixel's attributes come from the main image and some of the pixel's attributes come from the representation of the key. The construction of the pixel blending limitation is not in dispute. *See* Appx1163-1169.

The parties' main dispute is whether the variable-pixel control must be able to perform both functions—pixel selection ***and*** pixel blending—in creating a composite image. In other words, the issue is whether the variable-pixel control must be able to create composite images in which some of the pixels are selected entirely from the main image, some of the pixels are selected entirely from the representation of the key, and some of the pixels are blended. IV argued below that the variable-pixel control must be able to perform both claimed functions. Appx997-998. The Board disagreed, finding that IV "does not establish

adequately that claims 19 and 26 require both unblended and blended pixels simultaneously." Appx19.

The plain claim language shows that the Board's claim construction is erroneous. Appx997-998. The pixel selection limitation and the pixel blending limitation are two separate limitations. Indeed, the limitations are recited in two physically separate clauses of a method claim. Further, the claim limitations are joined with the word "and." The claims do not recite the pixel selection limitation ***or*** the pixel blending limitation; they require both functions. Accordingly, the fundamental rule of claim construction that ***every*** limitation must be given weight dictates that both pixel selection ***and*** pixel blending are required to satisfy the claims.

Despite the plain claim language, however, the Board inserted an "or" between the pixel selection limitation and the pixel blending limitation, finding that the claims can be satisfied by the performance of only one of the two claimed functions. Appx19. This finding was erroneous as a matter of law. Google's argument below that IV's construction "is unsupported in the specification" is both incorrect and irrelevant. When, as here, the claims expressly recite two separate

limitations, the specification does not make one of those limitations optional absent a clear and unambiguous disclaimer. *See Becton, Dickinson and Co. v. Tyco Healthcare Group, LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010) ("Where a claim lists elements separately, the clear implication of the claim language is that those elements are distinct components of the patented invention.") (internal quotations omitted); *Openwave Sys., Inc. v. Apple Inc.*, 808 F.3d 509, 513 (Fed. Cir. 2015).

Nothing in the specification constitutes a clear and unambiguous disclaimer of the plain claim language. Instead, the specification supports IV's construction. The '960 patent describes variable-pixel controls as including both selecting and pixel blending:

> ***[V]ariable-pixel controls*** are provided to determine and control which pixels of the touch screen will be used for displaying the keyboard representation and which pixels for displaying the main image. In some cases, each pixel of the screen is 100% dedicated to either the keyboard or the main image. In other cases, touch screen pixels may be dedicated to both the keyboard and the main image, producing a "blended" effect as will be described.

Appx115 at 4:33-41 (emphasis added); *see also* Appx114 at 2:8-13. The above passage describes both claimed features: dedicating 100% of a pixel to one of two images—pixel ***selection***—and dedicating a pixel to both images—pixel ***blending***. Appx1106-1107 ¶ 56. The '960 patent

further explains that a "virtual keyboard can be combined with the display using a variety of effects" so as to create a "myriad of meshing possibilities." Appx115 at 4:64-65; Appx116 at 5:39-41. Based on these teachings in the specification, Dr. Rosenberg testified that a skilled artisan would have understood that the two examples described above can be used together. Appx1117-1118 ¶ 75. Accordingly, claim 19's "variable-pixel control" positively recites both pixel selection and blending, consistent with the specification. Appx1107 ¶ 57.

Dr. Rosenberg further provided an example that illustrates an embodiment of the claimed combining selecting and blending as would be understood by a skilled artisan. Appx1116-1117 ¶¶ 73-74. First, he explained that pixel selection alone may be understood by the following composite image containing "K" pixels selected from a key image and "M" pixels selected from a main image:

K	M	M	M	K	M	M	M
K	M	M	M	K	M	M	M
K	M	M	M	K	M	M	M
K	M	M	M	K	M	M	M

Figure 1

Appx1116 ¶ 73. Then he described an example of blending alone, which employs a logical operator (such as "OR") so that each pixel receives a contribution from two images. Appx1117 ¶ 74. The following composite image includes blended pixels "*km*" having contributions from the key image and the main image:

km	*km*	*km*	*km*	*km*	*km*	*km*	*km*
km	*km*	*km*	*km*	*km*	*km*	*km*	*km*
km	*km*	*km*	*km*	*km*	*km*	*km*	*km*
km	*km*	*km*	*km*	*km*	*km*	*km*	*km*

Figure 2

Id. Google's Reply agreed that both Figures 1 and 2 accurately depict embodiments of the '960 patent. Appx1164.

Dr. Rosenberg then described a third drawing incorporating both selected pixels and blended pixels from Figures 1 and 2 to illustrate the claimed embodiment:

km	*km*	*km*	*km*	*km*	*km*	*km*	*km*
K	M	M	M	K	M	M	M
km	*km*	*km*	*km*	*km*	*km*	*km*	*km*
K	M	M	M	K	M	M	M

Figure 3

Appx1117-1118 ¶ 75. This figure depicts one example way in which a skilled artisan would have understood that the specification's "myriad of meshing possibilities" can create a "virtual keyboard . . . combined with the display." *See* Appx115 at 4:64-65; Appx116 at 5:39-41; Appx1117-1118 ¶ 75. Thus, the specification and extrinsic evidence—including Dr. Rosenberg's testimony—support IV's construction.

Moreover, IV's construction is the only reasonable construction in view of the prosecution history. Appx1028, Appx1036-1037; Appx2366-2367. The patent application claims that matured into claims 19 and 26, prior to the amendments that secured allowance, recited only pixel selection. Appx162-163 (application claim 19), Appx238 (application claim 28, which became claim 26). To secure allowance over the applied art, the applicant amended claims 19 and 26 to include blending ***in addition*** to selecting. Appx265-266. In view of this amendment, interpreting claims 19 and 26 to require selecting *or* blending would ignore that the applicant was required to claim *both* selecting and blending to obtain an allowance.

Because the Board's claim construction is incorrect as a matter of law, this Court should reverse the Board's construction, and find that claim 19 requires the variable-pixel control to perform ***both*** the pixel selection limitation ***and*** the pixel blending limitation. For similar reasons, claim 26 should be interpreted to require variable-pixel control to perform both the pixel selection limitation and the pixel blending limitation.

C. Gough does not anticipate claims 19-22, 24, and 26-30.

With respect to Gough, the Board did not make any findings under its construction of the pixel selection and pixel blending limitations. Instead, the Board found that "Gough *does* disclose displaying a composite image using both unblended and blended pixels." Appx19. This finding is not supported by substantial evidence and, thus, should be reversed.

Specifically, while Gough may disclose the pixel blending limitation of claim 19, it does not disclose the pixel selection limitation. Indeed, the Board did not find that Gough discloses the pixel selection limitation. Instead, the Board expressly found that "Gough's blending process involves ***blending*** data from blendable units . . . ." Appx19

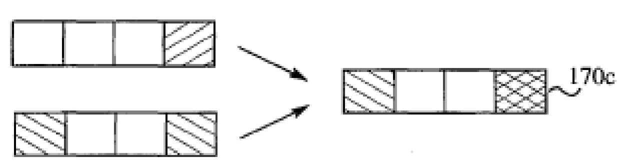
(emphasis added). This finding is consistent with Dr. Rosenberg's testimony:

> Gough describes ***blending*** together pixels of the base image with pixels of the overlay image, which allows for the base image to be seen through the translucent overlay image. This blending process generates blended images in which pixels have contributions from both pixels of the base image and pixels of the overlay image. No ***selection*** of pixels as described in claims 1, 19, and 26 is performed in Gough.

Appx1119 ¶ 77 (emphasis added); *see also* Appx1113-1115 ¶¶ 69-70. Therefore, because Gough does not disclose the pixel ***selection*** limitation, it does not anticipate claims 19-22, 24, and 26-30.

Rather than finding that Gough discloses pixel selection, the Board relied on the fact that the ***output*** of the "blending process" may sometimes look like the output of a selection process. Appx19. The Board specifically relied on Figure 10C:

Fig. 10c



The Board found that the "left-most blendable unit is an ***unblended***" pixel. *Id.* (emphasis added). But what the Board called an "unblended" pixel is actually created by ***blending*** a completely blank blendable unit with a non-blank blendable unit. The left-most blendable unit is ***not***

created by simply ***selecting*** the non-blank blendable unit, as is required by the pixel selection limitation. The fact that the output of Gough's "blending process" may by pure coincidence look like the output of a selection process—on the rare occasions when one of the two source blendable units is completely blank—does not show that Gough performs the pixel selection required by the claims.

Even if Gough's end result appears the same as a selection, Gough's ***process*** for obtaining that end result teaches blending, not selection. Claims 19 and 26 do not claim the final ***output*** of an image as showing a selection between pixels. Rather, they claim the ***process*** of selecting pixels to generate an output. Specifically, claim 19 requires "variable-pixel control causing pixels ***selected*** to form the representation of at least one key to be activated simultaneously with pixels ***selected*** to form the main image." Gough's different process cannot anticipate the claimed process regardless of any perceived similarity in their outputs.

Accordingly, the Board's finding that claims 19-22, 24, and 26-30 are anticipated by Gough is not supported by substantial evidence, and should be reversed.

D. <u>Buxton, Bier, and Harrison do not render claims 19, 20, 22, and 24-30 obvious as properly construed.</u>

The Board's finding that claims 19, 20, 22, and 24-30 would have been obvious relies on the Board's erroneous claim construction. Specifically, the Board agreed with Google's argument that Buxton "can produce unblended pixels" when Buxton's "alpha channel is set either to '1' or '0.'" Appx26. However, both Google and the Board acknowledged that "the equation results in a blended image" when the alpha channel is set anywhere between 0 and 1. *Id.* But nothing in Buxton discloses a pixel selection when the alpha channel is set either to 1 or 0. Rather, as Dr. Rosenberg explained, Buxton's equation always performs blending, regardless of the alpha values. Appx1136-1137 ¶ 112.

Buxton's equation is reproduced below:

$$I = \alpha I_1 + (1-\alpha)I_2$$

Appx440 at 17:17-28. Buxton explains that the quantity alpha ('α') can have values "between 0 and 1." *Id.* at 17:26-28. Buxton describes this equation as "an alpha blending algorithm," not a "blending algorithm with part-time selection depending on the value of alpha." Thus, by Buxton's own terminology, even at the extremes (α = 0 or 1), Buxton

still performs blending—blending with nothing, but blending regardless, not selecting.

Accordingly, even accepting the Board's findings, regardless of the values of Buxton's equation, Buxton does not meet the pixel selection limitation. Therefore, because Buxton's blending algorithm does not meet both the pixel selection and pixel blending limitations, the Board's obviousness finding necessarily rests on the Board's claim construction. Since that claim construction is incorrect, the Board's obviousness finding should be reversed.

X. CONCLUSION

For the foregoing reasons, IV requests that the Court affirm the Board's judgment that claims 1-3, 5, 7-10, and 12-14 are patentable, and requests that the Court reverse the Board's judgment that claims 19-30 are unpatentable.

Respectfully submitted,

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Date: August 17, 2016

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UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

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